

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	<u>Yakima Hops, Inc. and Hop Union USA, Inc</u>
Facility Address:	<u>P.O. Box 1411; Yakima, WA 98907 (approx. 121 acres at 1st Ave NW in Mabton, Yakima County)</u>
Facility EPA ID #:	<u>WAH 0001 0488</u>

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

_____X_____ If yes - check here and continue with #2 below.
_____ If no - re-evaluate existing data, or
_____ if data are not available skip to #6 and enter "IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**¹ above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>IN</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			See below
Air (indoors) ²		X		No significant VOC detections at the site in groundwater and soil.
Surface Soil (e.g., <2 ft)		X		See below.
Surface Water		X		See below.
Sediment		X		See below
Subsurf. Soil (e.g., >2 ft)		X		See below.
Air (outdoors)		X		No significant VOC detections at the site in groundwater and soil.

— If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

— If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

¹ "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Site Description:

The site includes a hop farm, residence, equipment storage areas, an area where poles used in hop farming were treated with a diesel based wood preservative solution containing Pentachlorophenol (PCP), and an area where drums containing used motor oil were stored. The site has been used for agricultural purposes since at least 1957. Hop pole wood treating and storage had occurred at the site since at least the early 1980s. The residence is located approximately 790 feet south west of the former hop pole dip tanks associated with the main PCP contamination at the site and there is a hop field between the residence and former dip tanks/hop pole storage areas. The residential well is approximately 765 feet to the southwest of the three monitoring wells initially installed in the former dip tank area. Groundwater flow at the site is northeasterly; therefore the residential well is upgradient of the former dip tanks and associated monitoring wells.

See attached Figure 2 for a site map/overview (from the February 2005 Site Characterization and Interim Corrective Action Measures Report). Areas to the north of the site are agricultural grazing lands, lakes, the Yakima River and associated wetlands. Other than the on-site seasonal irrigation pond, the nearest surface water body is Round Lake, which is located in the Yakima River floodplain approximately 200 feet northeast of the former dip tanks. There is an unnamed tributary draining into the lake approximately 360 feet north of the site. The Yakima River is approximately 0.5 miles north of the site.

The following discussions of whether human health exposures are under control are in regards to the current use of the site – agricultural (industrial). A future change in use to residential will require reassessment of the human health exposure.

Groundwater

The most recent on-site monitoring well groundwater results (November 4, 2004) show PCP is below levels of concern. The domestic well was sampled on October 4, 2004. Monitoring results showed PCP was non-detect.

Site groundwater is now non-detect for PCP and with the exception of a 0.315 ug/L detection in one well in 2002, has been non-detect in repeated monitoring between April 30, 2002 and November 2004 (the highest detection was 7.6 ug/L). It is unknown how much, if any, PCP contaminated groundwater historically reached the lakes/wetlands/Yakima River prior to removal of the units. See the surface water discussion for further information.

Metals were analyzed in the initial round of samples for MW-1, MW-2 and MW-3 (11/9/2000). At that time the metals levels were below EPA maximum contaminant levels (MCLs) for drinking water and Washington State Model Toxics Control Act (MTCA) levels of concern for residential (MTCA B) and industrial (MTCA C) groundwater cleanup goals. Since metals were not contaminants of concern at the time, no further metals monitoring was considered.

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Upon comparing historical monitoring well metals data against current NWQC, MTCA criteria, and federal MCLs, arsenic and lead now may be contaminants of concern at the site. The tables below summarize current/historic PCP, arsenic and lead levels (all criteria and results are in ug/L) and groundwater levels of concern:

	Highest PCP result	Most recent PCP result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	2.3	ND	1100	7.3
MW-2	2.32	ND	1100	7.3
MW-3	7.6	ND	1100	7.3
MW-4*	ND	ND	1100	7.3
MW-5*	ND	ND	1100	7.3

* Installed at a later date, only one set of data.

Samples collected 11/9/2000	Arsenic result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	26.0	11	0.58
MW-2	21.0	11	0.58
MW-3	17.0	11	0.58

Samples collected 11/9/2000	Lead result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	33.0	NR	NR
MW-2	29.0	NR	NR
MW-3	9.0	NR	NR

NR = not researched

Background levels of lead and arsenic in groundwater near the site is unknown. Although arsenic and lead may become contaminants of concern for the site, they are not at levels of concern for human health under current use conditions (agricultural with a single residence upgradient from historic hop pole treating activities) as the monitoring wells are not used as domestic water supplies. Under current use conditions, 'contaminated' groundwater on/from the site is not a completed exposure pathway for human health.

Outdoor/Indoor Air

Air monitoring has not been required for this facility as no significant VOC detections at the site in groundwater and soil have been documented.

Surface Water

New/future surface water contamination has now been minimized due to interim measures taken to remove contaminated soils. See the discussion under sediment regarding the irrigation pond. See the discussion under surface soil/subsurface soil and groundwater for potential historical contamination pathways.

Since PCP has a high affinity to adsorb to soils, it is considered sufficiently unlikely that PCP contained in groundwater would be detected in surface water and therefore confirmation sampling of surface water was not conducted.

Background levels of lead and arsenic in groundwater near the site is unknown. Even if the arsenic and lead groundwater ‘contamination’ is due to heretofore undocumented use of materials containing arsenic and lead, the contamination is only known to be in the monitoring wells associated with the historic wood treating process and the data was collected four years before the corrective actions taken to address soil and groundwater contamination from the PCP wood treating process. It is unknown if the groundwater from the monitoring wells ends up migrating into Round Lake/wetlands (Yakima River flood plain) to the north and/or the Yakima River. Even if site groundwater were to reach the river, there would be significant dilution long before it reaches the river a half a mile away. It is likely the adjacent wetlands/lake would act as a buffer between the site and the Yakima River. Round Lake and the wetlands are not known to be areas used for recreational fishing. Groundwater to off-site surface water is not considered to be a completed exposure pathway for human health.

Sediment

The only sediment on the site that could potentially be contaminated is sediment in the irrigation ponds with a bank at least 20 feet lower than the surface adjacent to the former dip tanks. According to the Site Characterization and Interim Corrective Action Measures Report (ICAM) the pond is used seasonally to store irrigation water and no practices that could potentially result in a hazardous substance release, or evidence that a hazardous substance release has occurred, have been identified in this area.

New/future sediment (both on and off site) contamination from current contaminants of concern has now been minimized due to interim measures taken to remove contaminated soils.

Based on a review of available information and data, EPA has concluded that activities on site are unlikely to have resulted in significant contamination of sediment.

Surface soil/subsurface soil (remaining discussion is specific to areas of concern on the site)

Dip tank area contamination:

Remaining product and dip tanks associated with the pole preservation process have been removed. PCP contaminated soil was removed to 12 feet (14 feet in a small area just east of the tanks) below ground surface (bgs). Confirmation samples taken at a depth of 6 feet along the walls of the excavated area showed PCP to be ND.

Known PCP contamination has been removed to levels below the cleanup goal (3 mg/Kg) agreed to by EPA and the Yakama Tribe. However, prior to a change in land use, further characterization of soil, especially at the surface, will be required west and south of the excavation area. Worst case hypothetical surface PCP contamination is below levels protective of current land use (industrial).

Treated hop pole storage area contamination/dioxin risk assessment:

Known PCP contamination has been removed to levels below the cleanup goal. However, prior to a change in land use, further characterization of soil, especially at the surface, will be required near/around storage areas already evaluated/excavated for PCP contamination. There may also be further storage and/or runoff pathways that need to be sampled. However, worst case hypothetical surface PCP contamination (based on historical data) is below levels protective of current land use (industrial).

PCP solutions are known to contain traces of dioxins/furans. Based on limited historical information on dioxin and furan levels in the soils historically contaminated with PCP, EPA required the collection of a dioxin/furan sample in the three excavated areas associated with historic hop pole storage and PCP contamination. The collection of these three dioxin samples was from native soil underlying the excavated areas that were backfilled. These three composite samples were collected in April 2006 and the results are summarized in a July 31, 2006, draft dioxin risk assessment (RA). The RA shows that the human health risk associated with the results of the three composite samples is less than 1×10^{-5} for industrial use, below the level of concern. The dioxin risk assessment is currently being reviewed by EPA to determine if a future residential use scenario would pose a risk greater than 1×10^{-5} .

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	No	No	No	No	No	No	No
Air (indoors)	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
Air (outdoors)	No	No	No	No	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

 X If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

Rationale and Reference(s):

Contaminated groundwater is not a complete exposure pathway for on-site workers as monitoring well sampling stopped in 2004 (after multiple rounds of monitoring showed that PCP was no longer detected in the groundwater).

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**⁴ (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”□

_____ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”□

_____ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

☒ YE - Yes, "Current Human Exposures Under Control" has been verified.
Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Yakima Hops, Inc. and Hop Union USA, Inc facility, EPA ID # WAH 0001 0488, located at 1st Ave NW in Mabton, Yakima County, WA, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

☐ NO - "Current Human Exposures" are NOT "Under Control."□

☐ IN - More information is needed to make a determination.

Completed by	(signature)		Date	
	(print)	Laura Castrilli		September 28, 2006
	(title)	Environmental Scientist		

Supervisor	(signature)		Date	
	(print)	Rick Albright		
	(title)	Director, Office of Air Waste and Toxics		
	(EPA Region or State)	EPA Region 10		

Locations where References may be found:
RCRA site files U.S. EPA Region 10 1200 Sixth Avenue, AWT-121 Seattle, WA 98404

Contact telephone and e-mail numbers

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.